

Please amend page 20, line 1 as follows:

**Claims What is claimed is:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

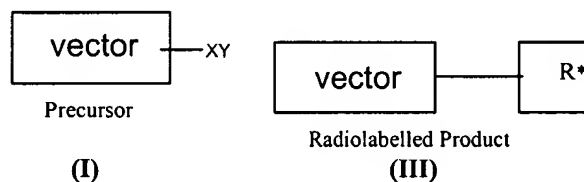
1. (Original) A process for purifying a radiolabelled product which comprises use of a solid-support bound scavenger group of formula (IV):



wherein Z is a scavenger group and SP is a solid support.

2. (Original) A process comprising the steps of:

(a) contacting a solution-phase mixture of a radiolabelled product of formula (III) and excess precursor of formula (I):



wherein XY is a functional group and R\* is a radioisotope or radiolabelled portion;  
with a compound of formula (IV):



wherein Z is a scavenger group;

such that the compounds of formulae (IV) and (I) may form a covalent bond to each other;

(b) separation of purified radiolabelled product of formula (III) in the solution phase.

3. (Currently amended) A process according to claim 1 ~~or 2~~ wherein the scavenger group Z is an isocyanate, isothiocyanate, thiol, hydrazine, hydrazide, aminooxy, 1,3-dipole, aldehyde or ketone.

4. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of:

(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIa) and excess precursor of formula (Ia):



wherein R<sup>1</sup> is C<sub>1-6</sub> alkyl and R\* is [<sup>11</sup>C]-C<sub>1-6</sub>alkyl, such as -<sup>11</sup>CH<sub>3</sub> or [<sup>18</sup>F]fluoro C<sub>1-6</sub> alkyl or [<sup>18</sup>F]fluoro C<sub>6-12</sub> aryl;

with a compound of formula (IVa):



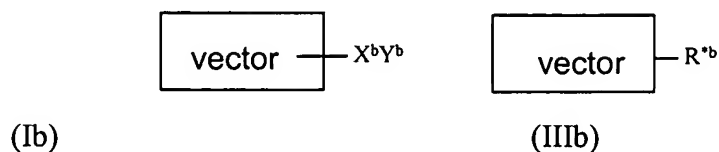
wherein R<sup>2</sup> is oxygen or sulphur

such that the compounds of formulae (IVa) and (Ia) may form a covalent bond to each other; and

(b) separation of purified radiolabelled product of formula (IIIa) in the solution phase.

5. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of:

(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIb) and excess precursor of formula (Ib):

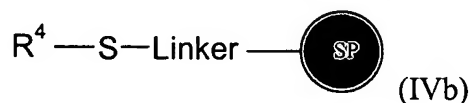


wherein either

(i) the functional group  $-X^bY^b$  in the compound of formula (Ib) is  $-\text{OSO}_2\text{R}^3$  wherein  $\text{R}^3$  is  $\text{C}_{1-15}$  alkyl or  $\text{C}_{1-10}$  alkylaryl and  $\text{R}^3$  is optionally substituted by halo (preferably fluoro), for example  $\text{R}^3$  is methyl, para-toluene, trifluoromethyl, and  $\text{R}^{*b}$  in the compound of formula (IIIb) is a radiohalogen such as radiofluoro (for example  $^{18}\text{F}$ ) or radioiodo (such as  $^{123}\text{I}$ ,  $^{124}\text{I}$ , or  $^{125}\text{I}$ ) or radiobromo (such as  $^{76}\text{Br}$ ); or

(ii) the functional group  $-X^bY^b$  in the compound of formula (Ib) is  $-\text{C}(\text{O})\text{CH}_2\text{Cl}$  and  $\text{R}^{*b}$  in the compound of formula (IIIb) is  $-\text{S}-\text{L}^b-^n\text{F}$  wherein  $\text{L}^b$  is a  $\text{C}_{1-30}$  hydrocarbyl linker group optionally including 1 to 10 heteroatoms; and  $^n\text{F}$  is a radioisotope of fluorine such as  $^{18}\text{F}$ ;

with a compound of formula (IVb):



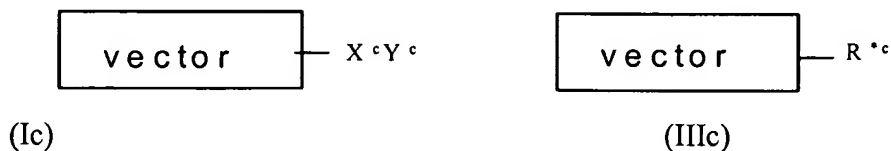
wherein  $\text{R}^4$  is hydrogen;

such that the compounds of formulae (IVb) and (Ib) may form a covalent bond to each other;

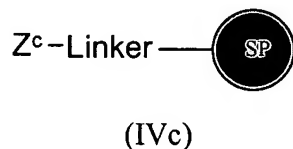
(b) separation of purified radiolabelled product of formula (IIIb) in the solution phase.

6. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of:

(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIc) and excess precursor of formula (Ic):



wherein the functional group  $-X^cY^c$  in the compound of formula (Ic) is an aldehyde or ketone and  $R^{*c}$  in the compound of formula (IIIc) is  $=N-W-Linker-F$  where W is  $C_{1-15}$  alkyl or  $C_{7-15}$  aryl, with a compound of formula (IVc):



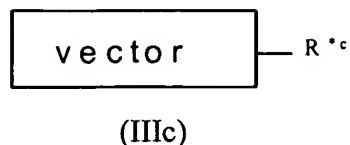
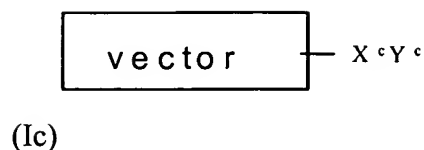
wherein  $Z^c$  is selected from  $-NH_2$ , hydrazine, hydrazide, aminooxy, phenylhydrazines, semicarbazide, or thiosemicarbazide;

such that the compounds of formulae (IVc) and (Ic) may form a covalent bond to each other; and

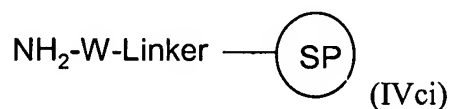
(b) separation of purified radiolabelled product of formula (IIIc) in the solution phase.

7. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of:

(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIc) and excess precursor of formula (Ic):



wherein the functional group  $-X^cY^c$  in the compound of formula (Ic) is  $-\text{OSO}_2\text{R}^3$  wherein  $\text{R}^3$  is  $\text{C}_{1-15}$  alkyl or  $\text{C}_{1-10}$  alkylaryl and  $\text{R}^3$  is optionally substituted by halo (preferably fluoro), for example  $\text{R}^3$  is methyl, para-toluene, trifluoromethyl and  $\text{R}^{*c}$  in the compound of formula (IIIc) is  $=\text{N}-\text{W}-\text{Linker}-\text{F}$  where W is  $\text{C}_{1-15}$  alkyl or  $\text{C}_{7-15}$  aryl, with a compound of formula (IVci):

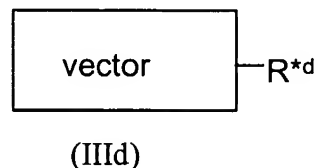
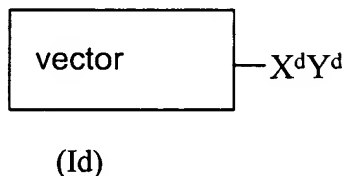


where W is selected from  $\text{C}_{1-15}$  alkyl or  $\text{C}_{7-15}$  aryl,  $-\text{NH}-$ ,  $-\text{NH}-\text{CO}-$  or  $-\text{O}-$ ; such that the compounds of formulae (IVci) and (Ic) may form a covalent bond to each other; and

(b) separation of purified radiolabelled product of formula (IIIc) in the solution phase.

8. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of:

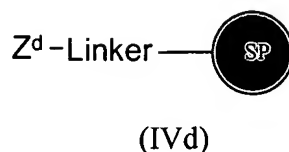
(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIId) and excess precursor of formula (Id):



wherein the functional group  $-X^dY^d$  in the compound of formula (Id) is an amine, hydrazine, hydrazide, aminooxy, phenylhydrazine, or semicarbazide, thiosemicarbazide group and  $\text{R}^{*d}$  in the compound of formula (IIIId) is

=CH-Linker-F where the linker comprises an alkyl, aryl or polyethylene glycol component;

with a compound of formula (IVd):



wherein  $\text{Z}^{\text{d}}$  is an aldehyde or ketone moiety;

such that the compounds of formulae (IVd) and (Id) may form a covalent bond to each other; and

(b) separation of purified radiolabelled product of formula (IIIId) in the solution phase.

9. (Original) A process according to claim 8 wherein the compound of formula (IVd) has a ketone scavenging group based on a ring-opening metathesis polymerisation (ROMP) polymer backbone.

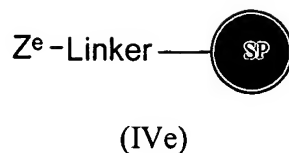
10. (Currently amended) A process according to ~~any of claims 1 to 3~~ claim 1 comprising the steps of

(a) contacting a solution-phase mixture of a radiolabelled product of formula (IIIe) and a by-product (VIIe):



wherein the by-product (VIIe) contains an unwanted double bond, formed by an elimination side-reaction, and R<sup>\*e</sup> in the compound of formula (IIIe) is radiohalo, particularly [<sup>18</sup>F]fluoro;

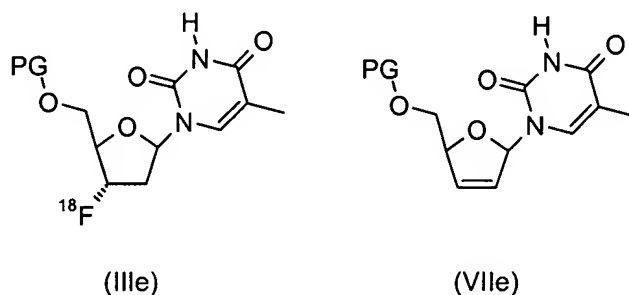
with a compound of formula (IVe):



wherein  $\text{Z}^{\text{e}}$  is a 1,3-dipole such as  $-\text{N}=\text{N}^+=\text{N}^-$  or  $-\text{C}\equiv\text{N}^+-\text{O}^-$  such that the compounds of formula (IVe) and (VIIe) may form a covalent bond to each other; and

(b) separation of purified radiolabelled product of formula (IIIe) in the solution phase.

11. (Original) A process according to claim 10 wherein the compound of formula (IIIe) and (VIIe) are:

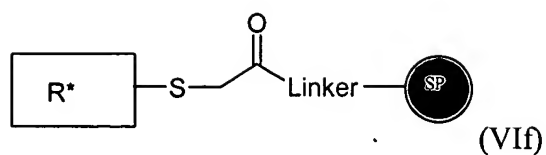


wherein each PG is hydrogen or a hydroxyl protecting group (suitably tert-butoxycarbonyl, benzyl, triphenylmethyl, or dimethoxytriphenylmethyl).

12. (Original) A process according to claim 1 which comprises use of a compound of formula (IVf):



wherein  $\text{Z}^{\text{f}}$  is  $\text{Cl}-\text{CH}_2-\text{CO}-$  or another haloacetyl containing moiety for removal of unreacted radiolabelling agent containing a thiol moiety from a reaction mixture resulting in formation of a compound of formula (VI f):



wherein R\* is a radioisotope or radiolabelled portion.

13. (Currently amended) An automated radiosynthesis apparatus, or a cassette therefor, comprising a vessel, such as a cartridge, containing a solid-support bound scavenger group of formulas comprising: ~~(IV), (IVa), (IVb), (IVc), (IVd), (IVe), or (IVf) as defined in claims 1 to 12.~~

